THE INDICATIONS FOR OPERATION IN THE TREATMENT OF TUBERCULOUS CERVICAL LYMPH GLANDS*

A PRELIMINARY REPORT

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Amongst a large number of clinicians both here and abroad, reaction against surgery places on the defensive, the advocate of operation for tuberculous glands. On the continent of Europe, non-operative treatment (other than the use of an aspirating needle) is decidedly in favor. This influence has been largely responsible for the present conservative attitude toward the disease in America. The use of X-ray therapy, the systematic application of sunlight, the importance of eradicating foci of secondary infection, like the teeth and the tonsils, and indeed in this country, the feeling that tuberculosis is on the wane, have been strong factors in the decline of radical surgery.

A few years ago, medical students were quite generally taught that the standardized treatment for tuberculous glands of the neck was radical excision. The surgical wards of our hospitals then bore evidence of the weight of this teaching. The problem was then simple because it was standardized. Statistics were available on the operative results so that we knew about what to expect from operation. Coincident with the gradual abandonment of radical surgery by large numbers of the profession, the standardized treatment has disintegrated. A generally accepted standard does not exist. The disease to-day is treated by numerous methods—here by one method and there by another—and often with brilliant results; yet this individuality of method, in distant geographical points, has tended to confuse our minds in outlining the treatment of a given patient.

Tuberculosis of the cervical glands in itself is not a serious disease. It is often a self-limited disease. The chief complaint of the patient is either the deformity of a swelling, or the annoyance of a persistent sinus. The aim of treatment is a good cosmetic result which shall be permanent.

Seven years ago this month, in October, 1917, a special study of tuberculous glands was undertaken at the Presbyterian Hospital, New York. During this period over three hundred patients with the disease have been examined and treated; and most of them have been followed. The diagnosis of tuberculosis has been proven in the majority of the patients, while in the others it has been accepted only on satisfactory clinical evidence. The work has been limited almost exclusively to New York City people of small means, and represents an attempt to help them, with the opportunities available, to their greatest economic advantage. The problem would be easier and the results, better were it undertaken where air and sun are ideal as in the Swiss Alps, on a favorable seacoast, or in Southern Arizona.

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During the first five years, we concentrated upon the effects of repeated small doses of filtered X-ray—a popular method of conservative treatment. From this X-ray part of the study we have drawn certain definite conclusions.

During the past two years, we have enlarged the scope of treatment hoping to raise the percentages of success over the results with the X-ray treatment. We now do everything we can for the patients, including selected operations.

This article deals with the operative indications and we hope that a report upon this part of our present working plan may help to formulate a general standard of treatment.

Let us for a moment first briefly examine some of the observations made after analyzing the X-ray results. These have been reported before the Saranac Lake Medical Society, but not yet published. The method of analyzing the main results was twofold: first, the results in the patients as a group, irrespective of their detailed neck pathology; and secondly, the results in various types of tuberculous neck lesions.

The five main types of lesions were classified as follows:

1. Enlarged firm swellings of less than 2 cm. in diameter.
2. Enlarged firm swellings of 2 cm. or more in diameter.
3. Cystic, or faintly fluctuating swellings.
4. Definitely fluctuating swellings—cold abscesses.
5. Sinuses.

It was found, taking the group of 141 patients, as a whole, treated with relatively frequent small doses of filtered X-ray, that 70 per cent. of these patients showed either apparent cure or such marked improvement as to justify conservative treatment. Thirty per cent. were failures. The results with the five main types of lesions were as follows: Conservative (X-ray) treatment appeared satisfactory in 78 per cent. of the small sized, firm swellings; in 72 per cent. of the large sized firm swellings; in 40 per cent. of the cystic swellings; in none of the cold abscesses as such; and in 76 per cent. of the sinuses. Eighty-five per cent. of the patients were followed after the last X-ray treatment for periods from a few months to four and one-half years.

Thus the small sized swellings and the sinuses responded best to conservative treatment. Some of the cystic swellings did resolve, but most of them became cold abscesses. The cold abscesses either opened spontaneously or were incised when spontaneous opening appeared to be inevitable. It must be stated that besides X-ray treatment these patients received personal supervision of their general hygiene, attention to possible foci of infection, cod-liver oil and whatever simple aid seemed advisable in ambulatory, New York City patients. Sunlight, artificial light, systematized rest, tuberculin, life in the open air and operation were not used to any significant extent.

Combined treatment appeals to us as better than X-ray treatment alone. We are trying to determine the indications for the different therapeutic methods, particularly for operation.

A number of different elemental points are to be considered in deciding questions of operation in a given case. They are (1) the anatomy and (2) the pathology of the neck, (3) general considerations of the patient, and (4) the operative procedures available.

I. *The Anatomy of the Neck.*—This is discussed under two headings, the regions involved by the diseased glands and the important structures which may be damaged by operation. There are fourteen important regions of lymph-gland disease (Fig. 1): 1. The parotid or preauricular region containing both superficial and deep glands, both of which are frequently involved. 2. The facial or supramaxillary region, rarely involved. 3. The submental and suprahyoid, the glands in which are most commonly involved with the anterior submaxillary lymph-glands. Region 4 includes the anterior, middle and posterior submaxillary lymph-glands. These are frequently involved, both singly and conjointly. Region 5 is the commonest location of all for tuberculous glands and is also usually the earliest. It includes most of the upper deep cervical (upper jugular) glands with the so-called tonsillar gland, better termed the "subangular" gland, below the angle of the jaw. Region 6 lies beneath the upper part of the sterno-mastoid muscle and contains the highest of the upper deep cervical group. Regions 7 and 8, include the more isolated, posterior auricular and suboccipital glands which are, like the chain in the posterior triangle, all relatively superficial as in regions 9 and 12. Regions 10 and 11 contain the lower deep cervical glands lying along the internal jugular vein. A high percentage of the supraclavicular enlargements (region 13) in tuberculosis belongs to these lower deep cervical glands which have enlarged backward. The involvement of the axillary glands (region 14) is conceived of as the extension simply to another group of cervical glands, except in such patients as have tuberculosis of the upper limb, the

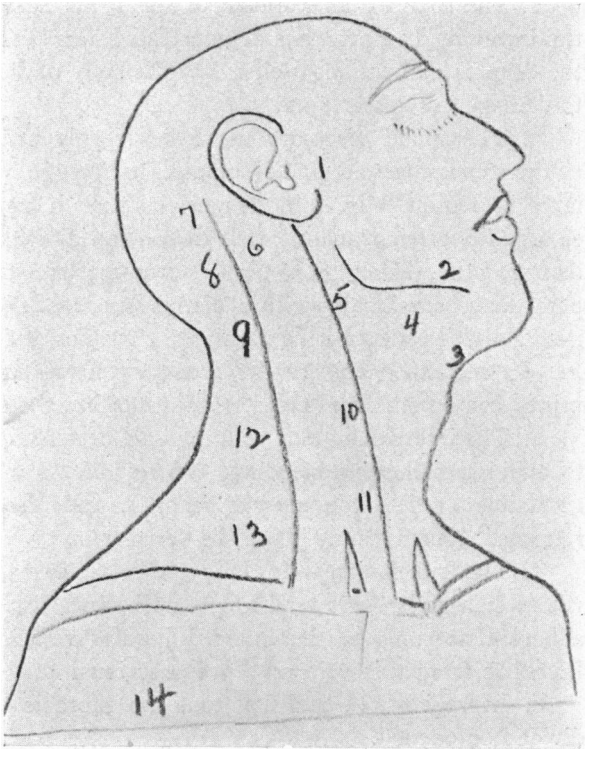

FIG. 1.—The main regions of the neck (with the axilla) involved in tuberculosis of the lymph-glands.

chest wall or the breast. Tuberculous glands are rarely adherent to the axillary vein, so that their removal is not commonly attended by risk to adjacent structures.

The Six Important Neck Structures.—1. The main branches of the facial nerve are not exposed to damage by operations in this disease except in the parotid or preauricular region (1).

2. The submaxillary branch of the facial nerve supplying the muscles of the lower lip as Farr [1] has demonstrated, lies beneath the superficial layer of the deep fascia running well below the body of the lower jaw. It is exposed to damage in regions 4 and 5.

3. The spinal accessory nerve lies deeply placed beneath the upper part of the sterno-mastoid, and is exposed to damage in regions 5 and 6. Particularly in region 6 is it in danger, because it may become adherent to the enlarged overlying nodes. It is then often difficult to identify. When cut or damaged in this region both sterno-mastoid and trapezius muscles are paralyzed, occasionally with a distressing result. Apparently the nerve need not be divided to cause the paralysis. Trauma and subsequent fibrosis may do so. In regions 9 and 12 the accessory nerve again becomes susceptible to injury in its path from the sterno-mastoid to the trapezius.

4. The internal jugular vein must be protected in its whole extent in order to avoid troublesome bleeding. In region 11, where the vein is less easily accessible (unless the muscle be cut), and also less easily mobilized and retracted, bleeding may indeed be dangerous.

5. The subclavian vein is exposed to damage in regions 11 and 13, where enlarged glands tend to extend backward beneath the muscle becoming adherent not only to the internal jugular vein, but also to the subclavian. Bleeding from this vein may prove serious.

6. In regions 11 and 13, too, the thoracic duct may inadvertently be divided or opened.

Aching shoulder is occasionally seen following a simple biopsy in the posterior triangle when the accessory nerve is thought to have escaped injury. The cause of this is not known. One theory is that it is due in some way to division of the descending cutaneous branches of the cervical plexus. Temporary numbness of the face, ear and neck following division of the upper cutaneous branches of the cervical plexus usually is inevitable and of only slight importance.

In certain parts of the neck there are features that appear to favor resolution without excision. It is noticed, for example, in the supraclavicular region (13) that conservative treatment is more successful than in region 5. The glands in region 13 are by nature almost completely immobilized; they are protected by the clothing from handling and from cold; they are far removed from the common foci of infection above. Conservative (non-operative) treatment here, therefore, is justified because it is more successful, because from the cosmetic viewpoint it is less imperative and because excision

endangers important structures. The constant motion of the axilla, however, militates against resolution here (region 14).

II. *The Pathology of the Neck.*—In a previous paper[1] attention was called to the applied pathology of the disease. Mention has already been made of the five main types of lesions. Since then a sixth type, "diffuse, firm swelling" has been added, so that now the list is as follows: 1. Enlarged, firm glands of less than 2 cm. in diameter. 2. Enlarged, firm glands of 2 cm. or more. 3. Diffuse, firm swelling. 4. Cystic or faintly fluctuating swellings. 5. Cold abscesses or definitely fluctuating swellings. 6. Sinuses.

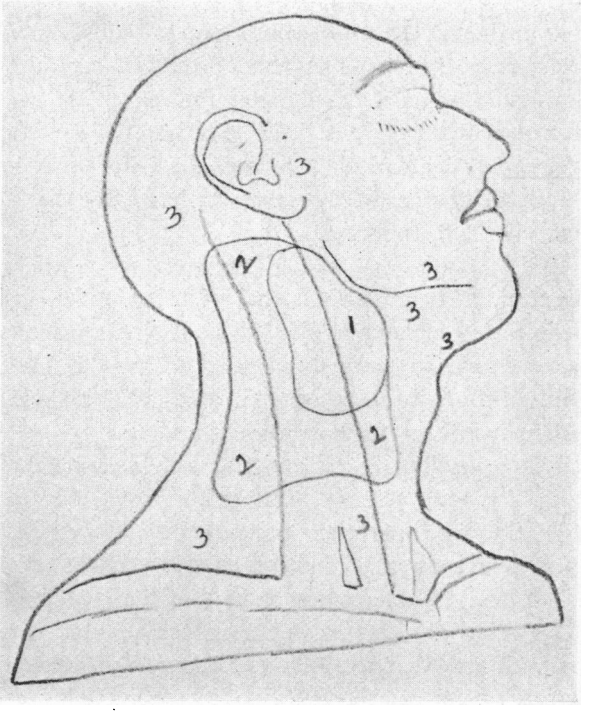

FIG. 2.—A schematic representation of the three groups of Dowd. Group 3 includes Groups 1 and 2.

The smaller glands have a better prognosis than the larger ones with conservative treatment. Diffuse, firm swelling is rarely suitable for operative treatment. The cystic swellings are separated because they have a fair chance of resolution without softening, under conservative treatment, whereas a more definitely fluctuating lesion, a cold abscess, has very small chance of resolution, without sinus formation. These various types of lesions may occur singly or may occur in any number of combinations in two or more of the fourteen main regions.

Dowd,[3] in 1916, treated the working pathology by describing three groups of cases. These are explained best in the diagram (Fig. 2). His "group 1" corresponds to any of our first five types if located in region 5. "Group 2" corresponds to group 1 which has developed a sinus, or to group 1 which has extended into our regions 6, 8, 9, 10 and 12, with any of our first five types of lesions. "Group 3" includes those patients with extensive cervical tuberculosis having any of our types of lesions and usually with evidences of tuberculosis in other parts of the body. The neck infection in group 3 involves a great number of nodes and displays all types of lesions.

An analysis of the neck pathology must be made in every patient before outlining the plan of treatment. As the course progresses this plan of treatment is always open to change dependent upon the variations in the neck

pathology. The operative indications may be quite different after the period of conservative treatment from what they were at the start. X-ray therapy, for example, tends to disperse a diffuse, firm swelling and to isolate localized swellings suitable for excision. We have found that X-ray therapy does not appear to increase the difficulty of the simple excisions used in our plan of treatment. An abscess may be incised in one stage of treatment and later, the remaining lesion (perhaps a sinus or a small firm mass), may be suitable for excision. If we discount general considerations we always have certain definite local findings capable of analysis for the outline of treatment. These local findings are based upon the six main types of lesions and upon the fourteen main regions. We may also have to reckon with such questions as the removal of an old scar and the extent of coincident pyogenic infections. With all this knowledge, then, at hand, there is some approach to a formula for operative treatment.

III. *General Points Relating to the Patient.*—Age. A common conception of tuberculosis is that of infection in early childhood, of distribution manifested in later childhood, and of extension or of recrudescence in later years in parts previously invaded during the stages of infection and of distribution. Broadly speaking, the forces of resistance increase with age. To operate upon a tuberculous lesion in a child under five years of age predisposes that child to distribution, the most striking example of which is tuberculous meningitis. It may be safe to make this rule, therefore, that with a child under five, the only operations permitted are the simpler ones of aspiration and of simple incision of cold abscesses and perhaps occasionally of gentle curettage.

Race. It has seemed to us that the Negro and the Chinese in our series have relatively low resistance or a relatively high state of hypersensitiveness, or both, and that with them at all ages, greater caution is needed in operating upon tuberculous lesions for fear of inducing distribution or extension and recrudescence elsewhere.

The forces of resistance. Besides age and race, the signs of good nutrition and good health are the important ones. Resistance should reach its maximum at the end of the period during which all the well-known and accepted methods of conservative treatment have been employed. This, then, is undoubtedly the safest time for operation. But practically in the majority of cases, operation is indicated in a much earlier stage of the treatment period, usually indeed at the very start, as we shall soon see.

Active tuberculosis elsewhere than the neck or axilla. As a general rule, the non-cervical tuberculosis takes precedence so that the whole plan of treatment depends upon the needs of the more important lesions. The commonest one, of course, is pulmonary tuberculosis. This main principle usually may be followed, that only operations of the simpler class are indicated upon the neck in patients with active disease within the chest or abdomen. More radical steps occasionally may be taken in the neck in the case of coincident external lesions in patients over seven or eight years of age.

Hypersensitiveness. In patients with tuberculosis of the neck, a state of hypersensitiveness may exist in the presence of any of the following conditions: (1) Fever, whether due to active tuberculosis anywhere in the body or due to pyogenic or other infections in the neck or elsewhere. (2) Active tuberculosis elsewhere than the neck even without fever. (3) Within two months of a definite tuberculin reaction, as from too large a dose in treatment. (4) Within two months of an operation of the more extensive class upon tuberculous tissue anywhere in the body. (5) Within two months of a definite reaction of a large dose of X-ray treatment which possibly acts like an overdose of tuberculin. These are largely theoretical, but nevertheless worthy of thought in deciding questions of operation upon tuberculous tissue.

While tuberculosis in the neck is not a serious disease, there is almost certainly some degree of intoxication exerting variable effects upon the general health and upon the heart, the liver, and the kidney.

The condition of possible foci of infection draining into the cervical lymphatics. The tonsils—shall they be removed before, during, or after an operation upon the neck? It is impossible to make rules covering all cases. There are two or three points of interest. It is probably unwise to let anything take precedence over the excision of a suitable neck lesion partly softened. On the other hand, it is gratifying to feel that the infection of the cervical glands by the operations upon the upper diseased foci has run its course and done its work before we attack the disease in the neck. Let the tonsillectomy, the tooth extraction, the radical mastoidectomy have their utmost effects upon the neck lymphatics before the final neck operation be planned. If the tonsils or adenoids prove to be tuberculous, it is probably safer to postpone the neck operation two months after their removal. They should always be examined after removal. With general anæsthesia it is usually advisable to do the simpler operations upon the neck under the same anæsthesia used for the operation upon the upper foci of infection; but for the extensive excisions in regions 4, 5, 10 and 14 (Fig. 1), the neck operation should be done at a separate time—afterwards if there is no softening beforehand.

The patient's choice. From our conclusions of the study of conservative treatment the chances of recovery without operation for different types of the disease can be estimated with an approach to accuracy. These, together with the operative statistics of Dowd,[3] give a good basis from which to conclude that careful excisions plus the conservative (non-operative) methods of treatment give better results in most of the early cases than does the conservative treatment alone. By better results we imply the main objects of treatment—safety, permanence, speed and appearance. The patient or the guardian must be given the information that no known plan of treatment can insure a cure; that recurrence may at any time appear no matter what be done; that complete excision in a given region may be followed immediately by new local or distant neck swellings; that operations of the more extensive class may inadvertently cause nerve damage; that well-planned incisions may

end in keloidal scars; and that after operation definite treatment and supervision are advisable over many months' time. The scars of the different types of operation must often be compared with each other and they must also be compared with the scars of existing sinuses and of spontaneous openings. Though operation be decided against at one time, the question should always be left open for the future. If operative scars be dreaded, reassurance can be given in the favorable effects upon them of the X-ray and light treatments.

IV. *The Available Operative Procedures.*—There are seven; and they are discussed in the order of their probable value as an aid to cure.

1. Complete excision of a lesion or of a group of lesions. Excision of a tuberculous lesion in any part of the body is the best method we have to attain a positive cure. The limitation to conservative treatment in pulmonary tuberculosis is after all but a makeshift because excision is impracticable. We can never be sure of having achieved a complete excision because of the uncertainty of involvement of surrounding or adjacent lymphatics; but no combination of conservative methods of treatment can assure destruction or permanent quiescence of tubercle bacilli.

Complete excision is the most fundamental part of treatment from the standpoint of cure. Excision is more likely to be complete if done before liquefaction-necrosis has thinned out the boundaries of the affected parts, and it is also more likely to result in a good cosmetic result, a clean linear scar. Therefore in the locations where complete excision is permitted this is the operative indication, and especially so with the large sized glands. But if liquefaction be detected the case at once becomes a surgical emergency so that excision shall precede the thinning out of the boundaries. This applies to the small as well as to the large glands. A few days delay will often entirely alter the favorable prospects of cure and of the linear scar. The detection of fluctuation, therefore, in an excisable region, indicates the need of excision within forty-eight hours as a general rule. If the patient be first seen when the skin is already thinned out, the same urgent need of early operation is demanded, so that whatever operation be selected it shall precede spontaneous rupture, with the consequent inevitable contamination of the part by secondary infection. Thus in the regions favorable for excision, we have two types of lesions calling for expedition in their operative treatment, cystic swellings and cold abscesses. They should not be kept waiting for a convenient time nor for an empty bed in a hospital. They need the considerations of an emergency.

The best follow-up results discovered for any method of treatment of tuberculous cervical glands are those of the large series of Dowd,[3] with whom 91 per cent. of patients in group 1 remained cured after excision. The key-notes to his success were early diagnosis in the early stage with early complete excision. If we add to excision in selected cases the conservative forms of treatment, may we not be approaching an ideal for our generation? Complete excision, however, is limited to certain regions of the neck for one main reason, namely, because endangering the important neck structures is not

justifiable in the face of the favorable results obtained by more conservative treatment.

A "bloc-dissection" of the neck for this disease is by this token alone never justifiable. Moreover, one can never foretell that such an extensive procedure will not be too great a drain upon the patient's resistance.

2. Excision of a part of the disease in a given region. This may be permitted at times provided the line of excision does not traverse gross tuberculous tissue. For example, it seems occasionally preferable to leave inaccessible glands during an attempted complete excision than to endanger important structures. The impression is that the removal of the bulk of the disease in a part favors the subsequent healing of the remainder. It is not ideal but it is safe, and when combined with the other forms of treatment offers a good prospect of cure. Procedures 1 and 2 are applicable to any type of lesion in any of the regions suitable for excision, provided the cleavage plane remains outside of the gross disease. The two main reasons for not keeping the cleavage plane outside of the gross disease are the dangers to important structures and the possible magnitude of the procedure. It is said that incomplete excision leads but to a persistent sinus. The reply to this is that 76 per cent. of our sinuses healed with conservative treatment.

3. Partial excision with curettage. The use of this procedure implies the presence of necrosis to the extent that the cleavage plane of an excision cannot be kept outside of the gross disease. Curettage is then substituted in part for excision.

4. Incision with curettage. Excision of a cold abscess is always preferable to curettage, as an ideal procedure. But if a cold abscess be too extensive or if the boundaries be too friable; if it lies in a region unsuitable for excision; if the skin be too extensively thinned out, then curettage through a small incision provides a safe method of removing the bulk of the disease with a minimum of risk and scar. Curettage may be practiced with varying degrees of gentleness and thoroughness depending upon the local and general conditions. A cold abscess often consists of a double or of a triple cavity formation wherein the superficial cavity signalizes deep-seated disease. Thorough curettage reaches all of the cavities, and if necrotic material be well removed, it may facilitate the ultimate healing, but blind force in reaching inaccessible pockets is to be avoided.

5. Incision. Incision alone without curettage is the simplest operative procedure next to aspiration. It is applicable only to the cold abscesses. Incision alone is indicated in the larger abscesses, especially in young children and in patients who may be hypersensitive to the toxins of tuberculosis. It is satisfactorily done with local anæsthesia whereas curettage usually requires nerve blocking or general anæsthesia.

6. Aspiration. Aspiration has been a disappointment in our series of patients. Like simple incision it is limited to fluctuating lesions. Experience has led to the following conclusions:

a. It is safe and it leaves no scar. b. There are no positive contra-indications to it *per se*. c. It may turn the tide toward resolution of cystic swellings and of cold abscesses during the course of conservative treatment. d. If successful, it is less likely to involve the skin and to leave a sinus than is incision. e. It does not so completely empty the cavity as does incision and by no means so completely as incision with curettage. f. Usually it must be repeated one or more times—more frequently than incision. g. Even when successfully carried out it usually fails to effect the resolution of a cold abscess. h. When it does result in apparent resolution, local recurrence is more frequent than with any of the other operative procedures for softened lesions. i. It is more distressing than simple incision because so much pressure is needed even with a nick in the skin to introduce a large needle at a distance from the involved skin. Success is mainly dependent upon a large needle. j. It fails in those lesions which though fluctuating are not fluid, whereas, through a small incision much of the soft necrotic material can be evacuated by light pressure.

7. Injections and aspiration.[4] The rationale of this practice is that by inducing liquefaction the disease can be aspirated away, giving a cure without a scar. It facilitates one of nature's methods of cure by softening and extrusion. Our studies have not included a trial of this plan of operative treatment so that no final opinion is justifiable. Since it aims at the production of a cold abscess and since our success with the aspiration of cold abscesses has been slight, it does not impress us favorably. It appeals to one as an indirect slow method of incomplete removal. There probably are, however, indications for its use if carefully studied.

The seven operative procedures are divisible into two classes, those which tend to induce distribution and hypersensitiveness and those which do not. In the first class are the three kinds of excision and the thorough curettage; in the second class, the simple incision (perhaps with gentle curettage) and aspiration. They are called respectively the "more extensive" and the "simpler" operations, because of the difference in degree to which they tend to open the lymphatic and the blood-vessels in the diseased region.

If a biopsy be needed to establish the diagnosis, it should be made therapeutic also if feasible.

With a knowledge of the normal anatomy and keeping in mind all the general considerations relating to the patients, it is possible to try to determine what operations are suitable for the different types of lesions in every one of the several regions.

Region 1—parotid. Conservative treatment appears to have a high percentage of success in the firm and cystic swellings. Excision is rarely indicated because of danger to the facial nerve. Incision with curettage (Fig. 3, 1A), simple incision (Fig. 3, 1B) and aspiration are suitable for abscesses.

Region 2—facial. Little experience with this region, on account of its rarity of involvement, justifies impressions only. The firm swelling rarely

becomes large so that a positive diagnosis is not usually made until softening has occurred, in which case the choice of excision or of one of the less complete operations in each case must be decided. There are no important structures to be damaged but the cosmetic result is important. (Fig. 3, 2).

Region 3—submental. Here there are no structures endangered by radical removal by the best method feasible of any type of lesion, the earlier the better. (Fig. 3, 3.) As a rule, however, the submaxillary lymph-glands (region 4) of one or both sides are simultaneously involved, in which case region 3 may be viewed as an operative part of region 4.

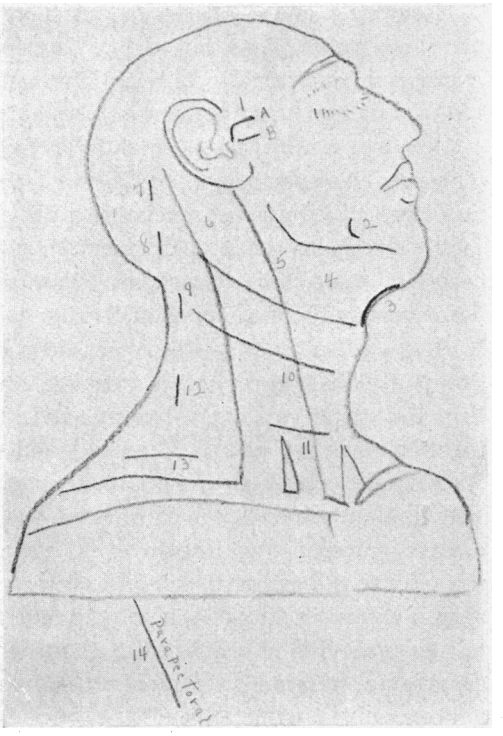

FIG. 3.—The common incisions.

Region 4—submaxillary. The submaxillary branch of the facial nerve to the muscles of the lower lip runs below the margin of the lower jaw beneath the superficial layer of the deep fascia.[2] A low incision is necessary to avoid cutting it. (Fig. 3, 4.) Excision of the firm and cystic swellings is done through a low incision without permanent damage to the nerve. It does become temporarily paralyzed, often due, perhaps, to traction upon the upper flap in which it lies. Permanent paralysis is an unfortunate disfigurement and should be avoided. It is seen most frequently after operations upon abscesses and sinuses when the nerve has become implicated, before operation, in the skin involvement. In these cases, a low incision is made and a partial excision with curettage is done. The upper flap is gently handled and its under surface lightly curetted with gauze. If permanent paralysis already exists, from a previous operation, then the nerve is disregarded and attempted complete excision is done.

Region 5—subangular. This is the region par excellence for a complete excision of any type of lesion. If the skin be extensively involved or the deep boundaries thinned out, partial excision with curettage may have to suffice. If the adjacent region 6 be conjointly diseased, excision only of that part of the disease in region 5 is done. Dowd says that "very few patients who have thorough operation when in group 1 ever reach group 2." We would reëmphasize the importance of immediate complete excision of all types of lesions limited to this region. The operation is safe; the scar is minimal; and the end results quoted above are highly satisfactory. If the disease be

limited to region 5 the spinal accessory nerve is usually spared with care. In region 5, a low incision is needed to avoid the nerve to the lower lip as in region 4. (Fig. 3, 4 and 5.)

Region 6—deep submastoid. Only the simpler operations are done in region 6. The spinal accessory nerve is spared at any cost. Complete excision is never attempted.

Regions 7 and 8—posterior auricular and suboccipital. The glands here are rarely tuberculous, but if the diagnosis be made before softening occurs, excision is indicated. The regions are safe so that attempted complete removal of any type of lesion is justifiable. (Fig. 3, 7 and 8.)

Regions 9 and 12—the middle part of the posterior, superficial chain of glands. The spinal accessory nerve traverses these regions. Isolated firm and cystic swellings are excisable with care, but the abscess should be subjected merely to the simpler operations. Sinuses may be curetted but their complete excision is hazardous. Paralysis of the trapezius causes aching, deformity and loss of function. (Fig. 3, 9 and 12.)

Regions 10 and 11—the lower deep cervical. In the upper part of this group of glands, in region 10, complete excision is indicated for circumscribed, firm and cystic swellings, abscesses and sinuses, provided there is no involvement below in region 11. Regions 5 and 10, if both are involved, are suitable for a single, complete excision of the whole mass; but if region 11 be involved with region 10, excision of part of the disease may be done, leaving the disease in region 11. Region 11 is dangerous because the disease here tends not only to adhere to the fixed lower part of the internal jugular vein, but also to extend backward beneath the muscle into region 13, becoming adherent to the subclavian vein and to the thoracic duct. Hence only the simpler procedures are indicated in regions 11 and 13. Fortunately their prognosis with non-operative treatment is relatively good. (Fig. 3, 10, 11 and 13.)

Region 14—the axillary glands. Complete excision is indicated with any or all types of lesions in the axilla unless there is the unusual condition of adhesions to the vein or to the plexus. In this case excision of part of the disease is done or, partial excision with curettage. (Fig. 3, 14.)

CONCLUSIONS

1. Operation is indicated in a large number of patients with tuberculous cervical lymph-glands.

2. It is impossible to make rules covering all the combinations of lesions and regions which may be seen in patients with more or less extensive involvement. An adaption of the main principles is worked out for every patient. Early removal of all tuberculous tissue is the ideal; but it must be tempered with an eye to the ultimate appearance of the neck and with safety to the patient and to the important structures. After time and conservative treatment have done their work, a later removal, if needed, is always worthy of consideration.

3. The results with conservative treatment (including the simpler operations) are so good that only those radical operations are done which are relatively easy and devoid of nerve and vein damage.

4. The more extensive operations are relatively safe in regions 3, 4, 5, 7, 8, 10 and 14.

5. Damage to the nerve to the lower lip is surprisingly frequent in regions 4 and 5.

6. Damage to the accessory nerve is not infrequent in region 5.

7. In Dowd's group 1 (region 5) early complete excision is recommended.

8. In his group 2 (regions 5, 6, 8, 9, 10 and 12) complete excision of the whole mass of disease is replaced by the safer but less ideal procedures as needed according to the lesions.

9. In his group 3 (scattered regions) the same attitude is held as for group 2.

10. Operative procedures are but a part of the whole plan of treatment and may be indicated at any period, depending upon the general and the local conditions.

11. The general and the local conditions are capable of definite analysis.

This preliminary report is presented with the expectation that from its criticism our ideas about operation will become more clear cut and better directed in the continuation of the attempt to standardize the treatment as a whole.

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